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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/812,846

03/30/2004

Toshihiro Suzuki

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24978

7590

08/31/2006

GREER, BURNS & CRAIN

300 S WACKER DR

25TH FLOOR

CHICAGO, IL 60606

EXAMINER

MAKIYA, DAVID J

ART UNIT

PAPER NUMBER

2875

DATE MAILED: 08/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/812,846	SUZUKI, TOSHIHIRO	
	<b>Examiner</b>	<b>Art Unit</b>	
	David J. Makiya	2875	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 22 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7 and 8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>6/30/06</u>   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Johnson et al. (US Patent 6,439,731) in view of Savage, Jr. (US Patent 5,068,771).

With respect to claims 1 and 8, Johnson et al. teaches a display device comprising a liquid crystal display panel 18; and a surface lighting device (Figures 1 and 2) comprising a surface light source 12 in which linear light sources (Figure 2) having light-emitting elements, which correspond to respective colors among combinations of plural colors at least including three primary colors of light (Column 5, Lines 36-39), arranged in series are arranged in a predetermined order, a reflection plate 10 which is laid so as to fill spaces (Figure 2) among the light-emitting elements constituting the linear light sources (Column 4, Lines 60-67), a substrate 10 on which the surface light source and the reflection plate are set, and a diffusion plate 20 which is located above the surface light source and the reflection plate and with the reflection plate positioned between the non-light-emitting portion of the light-emitting elements and the diffusion plate. However, Johnson et al. fails to teach the surface lighting device wherein non-light-emitting portions of the light emitting elements are covered by the reflection plate. Savage, Jr. et al. teaches a surface lighting device (Figure 5) comprising linear light sources (Figure 5) with light emitting portions 12 and non-light-emitting portions (13, 14) and a reflection plate 118

wherein non-light emitting portions of the light emitting elements are covered by the reflection plate (Figure 6) and light is emitted in a forwardly direction (161a, 162a; Column 3, Line 63-Column 4, Lines 17). It would have been obvious to one of ordinary skill in the art at the time of the invention to cover the non-light-emitting portions of the light-emitting elements of Johnson et al. with the reflector of Savage, Jr. because “the reflective surfaces collect light transmitted sideward from the diode to transmit such light generally forwardly; the diode forward extent openly transmits light forwardly for highest efficiency, and that light transmission is enhanced by light transmission from the reflective surface, which also has the effect of increasing the intensity and/or perceived size of the LED” (Savage, Jr.; Column 1, Line 65-Column 2, Line 4).

With respect to claim 2, Johnson et al. teaches a surface lighting device comprising a surface light source in which linear light sources having light-emitting elements, which correspond to respective colors among combinations of plural colors at least including three primary colors of light, arranged in series are arranged in a predetermined order and at a fixed interval, a first reflection plate which is laid so as to fill spaces among the light-emitting elements constituting the linear light sources, a substrate on which the surface light source and the first reflection plate are set, and a diffusion plate which is located above the surface light source and the first reflection plate. However, Johnson et al. fails to teach a second reflection plate having through holes in which light-emitting portions of the light-emitting elements can be fit and wherein non-light-emitting portions of light-emitting elements are covered by the second reflection plate. Savage, Jr. et al. teaches a surface lighting device (Figure 5) comprising linear light sources (Figure 5) with light emitting portions 12 and non-light-emitting portions (13, 14), a substrate 11, and a second reflection plate 118 having through holes 160 in which light-emitting

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portions of the light-emitting elements can be fit (Figure 6) wherein non-light emitting portions of the light emitting elements are covered by the second reflection plate (Figure 6) and light is emitted in a forwardly direction (161a, 162a; Column 3, Line 63-Column 4, Lines 17). It would have been obvious to one of ordinary skill in the art at the time of the invention to cover the non-light-emitting portions of the light-emitting elements of Johnson et al. with the second reflection plate of Savage, Jr. because “the reflective surfaces collect light transmitted sideward from the diode to transmit such light generally forwardly; the diode forward extent openly transmits light forwardly for highest efficiency, and that light transmission is enhanced by light transmission from the reflective surface, which also has the effect of increasing the intensity and/or perceived size of the LED” (Savage, Jr.; Column 1, Line 65-Column 2, Line 4).

Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weber et al. (US Patent 6,325,524) in view of Johnson et al.

With respect to claims 3 and 5, Weber et al. teaches a surface lighting device comprising a surface light source in which linear light sources having light-emitting elements (21-23), which correspond to respective colors among combinations of plural colors including at least three primary colors of light (Column 1, Lines 19-21), arranged in series are arranged in a predetermined order, a reflection plate 91 which is laid so as to fill spaces among the light-emitting elements constituting the linear light sources, a substrate 24 which has linear projected portions 91 arranged at a fixed interval and on which the surface light source and the reflection plate are set (Figure 2), wherein each of the linear light sources is arranged on only one of a slope or a side of the linear projected portions arranged at the fixed interval on the substrate (Figure 2), and an irradiation angle, at which an amount of light of the light emitting elements

corresponding to at least one color among the plural colors is maximized according to the interval of the linear projected portions and an interval between the optical system 29 and the substrate is set according to an angle of the slopes or the sides of the linear projected portions (Column 1, Line 58-Column 2, Line 8). Because the references teach the structure of the claimed surface lighting device, the references would also teach that the interval L, the interval H, and the irradiation angle such that a relation of  $L \leq 2 \times H \times \tan(\text{irradiation angle at which an amount of light of the linear light sources is maximized})$  is satisfied. However, Weber et al. fails to teach a diffusion plate which is located above the surface light source and the reflection plate. Johnson et al. teaches a lighting device comprising a surface light source 12, reflection plate 10, and a diffusion plate 20 which is located above the surface light source and the reflection plate (Figure 2). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the surface lighting device of Weber et al. with the teachings of Johnson et al. because a diffuser “convert light from lamp segments or discrete sources into a more uniform glow across the surface of LCD panel 18” (Johnson et al.; Column 6, Line 65-Column 7, Line 10).

Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. in view of West et al. (US Patent 6,679,621).

With respect to claims 4 and 7, Johnson et al. teaches a surface lighting device comprising a surface light source in which linear light sources having at least three light-emitting elements, which correspond to respective colors among combinations of plural colors at least including three primary colors of light, arranged in series are arranged in a predetermined order and at a fixed interval, a reflection plate which is laid so as to fill spaces among the light-

emitting elements constituting the linear light sources, a substrate on which the linear light sources and the reflection plate are set, and a diffusion plate which is located above the linear light sources and the reflection plate, the linear light sources are arranged in plural columns to form a surface light source. However, Johnson et al. fails to teach a light irradiation angle correcting means. West et al. teaches a light emitting element 40 and a light irradiation angle correcting means 56 in light-emitting portions 44 or on the light emitting portions of the light-emitting elements wherein an irradiation angle, at which an amount of light is maximized, is set by the light irradiation angle correcting means on the light-emitting portion of the linear light sources corresponding to at least one color among the plural colors according to the interval of the linear light sources and an interval between the diffusion plate and the substrate (Figure 5) and wherein a maximum irradiation angle of the light-emitting elements is corrected such that a point where a maximum irradiation direction of the light-emitting elements, which is corrected by the light irradiation angle correcting means in the light-emitting portions or on the light-emitting portions of the light-emitting elements constituting the linear light source of attention, and the diffusion plate cross with each other goes beyond a middle point of the linear light source adjacent to the linear light source of attention. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light emitting element of Johnson et al. with the teachings of West et al. to include an irradiation angle correcting means on the light-emitting portion of the linear light source because “the inventive lens may be advantageously employed to provide side-emitting light-emitting devices that may be used with light guides and reflectors that have very thin profiles and/or large illuminated areas” (West et al.; Column 2, Lines 17-20).

***Allowable Subject Matter***

Claim 6 is allowed.

The following is an examiner's statement of reasons for allowance: The prior art fails to teach or suggest "the light-emitting element groups are arranged to be deviated every other column or row such that a positional relation among the light-emitting element groups is a delta shape." The most pertinent art teaches light-emitting element groups deviated every other column or row, but is found to be in a rectangular shape. While any three groupings make up a triangular shape, they are not necessarily equilateral triangles, which is equivalent to the claimed delta shape.

The prior art made of record and not relied upon is considered pertinent to claim 6. Chou (US 2005/0169007) teaches a backlight with red, green, and blue LEDs in a triangular pattern.

***Response to Arguments***

Applicant's arguments with respect to claims 1-5 and 7-8 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's explanation, see pages 15-17, filed 5/22/2006, with respect to Claim 6 have been fully considered and are persuasive. The objection and rejection of Claim 6 has been withdrawn.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chou (US Patent 7,036,956), Pelka (US Patent 6,007,209) and Ohe (US Patent 5,093,768) teach reflection plates filling spaces between light emitting elements. Tanaka et al.



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(US 2006/0092618), Osawa et al. (US 2002/0001193), and Ng et al. (US 2006/0087866) teach substrates with linear protrusions and light sources mounted thereon.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David J. Makiya whose telephone number is (571) 272-2273. The examiner can normally be reached on Monday-Friday 7:30am - 4:00pm (ET).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (571) 272-2378. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DJM 08/29/2006

  
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